## AMENDMENTS TO THE CLAIMS

1-13. (canceled)

14. (currently amended): A method of designing and producing a polyketide synthase (PKS) gene, which method comprises:

(A) (a) defining the structure of [[the]] a desired polyketide by a first string of alphanumeric symbols, wherein each symbol in the first string represents a monomer unit of the desired polyketide,

(b) comparing the first string of alphanumeric symbols to a second string of alphanumeric symbols from a database,

wherein the database comprises at least one second string of alphanumeric symbols representing a known polyketide, and wherein each alphanumeric symbol in the second string represents a monomer unit of the known polyketide,

(c) identifying a common alphanumeric symbol or continuous sequence of alphanumeric symbols in said first and second strings,

(d) generating a third string, wherein the third string comprises ~~a combination of~~ the name of the known polyketide and the common alphanumeric symbol or continuous sequence of alphanumeric symbols identified from step (c), and wherein the third string represents the structure of a PKS gene encoding a PKS enzyme capable of producing the desired polyketide, [[and]]

(e) storing or displaying the third string, and

(f) using the third string ~~representing the structure of the PKS gene~~ to produce the PKS gene ~~desired polyketide~~; or

(B) the method of (A), wherein steps (b) and (c) are repeated.

15. (previously presented): The method of claim 14, wherein more than one third string of alphanumeric symbols is generated and displayed.

16. (previously presented): The method of claim 15, wherein the third strings that are generated are rated in an order based on one or more parameters.

17. (previously presented): The method of claim 16, wherein the parameters are selected from the group consisting of non-native polyketide module interfaces and non-native polyketide protein interfaces.

18. (currently amended): The method of claim 14, wherein the PKS gene is designed using a tangible computer-readable medium embodying a set of program instructions configured to enable a computing device to perform the method steps for designing the PKS gene encoding a PKS enzyme capable of producing the desired polyketide.

19. (currently amended): A computer-implemented method for designing and producing a polyketide synthase (PKS) gene, comprising:

(A) (a) receiving a first string of alphanumeric symbols representing the structure of [[the]] a desired polyketide, wherein each symbol in the first string represents a monomer unit of the desired polyketide,

(b) comparing the first string of alphanumeric symbols to a second string of alphanumeric symbols from a database,

wherein the database comprises at least one second string of alphanumeric symbols representing a known polyketide, and wherein each alphanumeric symbol in the second string represents a monomer unit of the known polyketide,

(c) identifying a common alphanumeric symbol or continuous sequence of alphanumeric symbols in said first and second strings,

(d) generating a third string, wherein the third string consists of ~~a combination of~~ the name of the known polyketide and the common alphanumeric symbol or continuous sequence of alphanumeric symbols identified from step (c), and wherein the third string represents the structure of a PKS gene encoding a PKS enzyme capable of producing the desired polyketide, [[and]]

(e) storing or displaying the third string, and

(f) using the third string ~~representing the structure of the PKS gene~~ to produce the PKS gene ~~desired polyketide~~; or

(B) the method of (A), wherein steps (b) and (c) are repeated.

20. (canceled)

21. (previously presented): The method of claim 14, wherein more than one third string is generated and stored.

22. (previously presented): The method of claim 21, wherein the third strings that are generated are rated in an order based on one or more parameters.

23. (previously presented): The method of claim 22, wherein the parameters are selected from the group consisting of non-native polyketide module interfaces and non-native polyketide protein interfaces.

24. (currently amended): A tangible computer-readable medium embodying a set of program instructions configured to enable a computing device to perform the method steps of claim 14.

25. (previously presented): A PKS gene designed and produced by the method of claim 14.

26. (previously presented): A PKS gene designed and produced by the method of claim 18.

27. (previously presented): A PKS gene designed and produced by the method of claim 19.

28. (previously presented): A PKS gene designed and produced by the method of claim 24.